Lecture 10

Gambling

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PS4168: Economic Psychology

Overview

- Economic Psychology of Some Gambling Games
- Problem Gambling
- Further Reading

Gambling

Gambling and Economic Psychology

- Mental Accounting example:
  - gamblers who have won some money early in the evening put that money into a different pocket from their 'own' money
  - each pocket is a separate mental account(Thaler, 2003, p. 94)

Gambling and Economic Psychology

Theories of Decision Making
Heuristics and Biases
Game Theory
Emotional Influences
Nudges and Other Contextual Influences
Future Decisions and Affective Forecasting
Loss Aversion/Risk Aversion and Endowment Effects
Mental Accounting
Fairness and Ethics

Gambling and Economic Psychology

Theories of Decision Making
Heuristics and Biases
Game Theory
Emotional Influences
Nudges and Other Contextual Influences
Future Decisions and Affective Forecasting
Loss Aversion/Risk Aversion and Endowment Effects
Mental Accounting
Fairness and Ethics

Identify examples of the above concepts in Gambling behaviour

Gambling

- Lotteries
- Scratch Cards
- Roulette
- Fruit Machines
- Sports Betting
- Card Games

Lotteries

Lotteries

- 180 lotteries worldwide
  - Total size of lottery industry is estimated to be $\$284\ billion$
  - In the United Kingdom, 59% of adults purchased the National (Markel, La Fleur, & La Fleur, 2015; Ranyard, 2018)

Lotto Rules

- Different lotteries have different specific rules
  - The UK uses a 6 from 49 system
  - Ireland uses 6 from 47
    - Used to be 6 from 36
  - Euromillions 5 from 50
    - Plus 2 *star* numbers from $1 - 12$

Lotto Combinations

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$$\frac{n!}{(n-x)!x!}$$

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$$\frac{n!}{(n-x)!x!}$$

```
factorial(47) /
  (factorial(47-6) * factorial(6))
```

```
[1] 10737573
```

- $10,737,573$ possible combinations

Winning through *brute force*

- Irish lotto used to be 6 from 36

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```
factorial(36) /
  (factorial(36-6) * factorial(6))
```

```
[1] 1947792
```

- $1,947,792$ possible combinations of *winning* at £0.50 a line

Winning through *brute force*

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```
factorial(36) /
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```

```
[1] 1947792
```

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```
factorial(36) /
  (factorial(36-6) * factorial(6))
```

```
[1] 1947792
```

- $1,947,792$ possible combinations of *winning* at £0.50 a line

```
0.5*( factorial(36) /
        (factorial(36-6) * factorial(6))  )
```

```
[1] 973896
```

- All combinations could be purchased for £$973,896$

Winning through *brute force*

- In 1990 Stefan Klincewicz and Paddy Mulligan put together a 10 man syndicate
  - Each person paid £30 over 10 weeks
  - Between them they won Lotto jackpot of £2,439,760 in April, 1990(Collins, 2017)

Winning through *brute force*

- In 1992 Stefan Klincewicz and 28 member Dublin-based syndicate
  - Filled out $243,474$ Lotto coupons in preparation
- The May Bank Holiday weekend 1992 Jackpot was $£1.7$ $million$
- They bought over 80% of the combinations (spending $\sim £820,000$)
  - They had the winning numbers on the night
    - But two other winning tickets were also sold
    - Could claim only one-third of the jackpot, or $£568,682$
  - ***But*** Match-5 and match-4 prizes brought the syndicate's total winnings to approximately $£1,166,000$
    - profit of approximately $£310,000$

Playing the Lottery

- The representativeness heuristic:
  - The winning numbers should look random
  - People likely avoid numbers that 'do not look random enough'
    - regular intervals or those that do not distribute sparsely across the whole range of possible numbers(Baboushkin, Hardoon, Derevensky, & Gupta, 2001; Holtgraves & Skeel, 1992)
- Illusion of control:
  - Over estimate ability to choose winning numbers
  - *Gambler's Fallacy*:
    - avoiding numbers that have appeared recently(Clotfelter & Cook, 1991; Langer, 1975; Wohl & Enzle, 2002)
- Superstition (Ariyabuddhiphongs & Chanchalermporn, 2007)

Explaining the Lottery

- Suggestions?

Explaining the Lottery

- Prospect Theory: People tend to overestimate low odds of winning
  - far lower than what people experience in everyday life
  - fail to estimate just how tiny they actually are (Kahneman & Tversky, 1979; Ranyard, 2018)
- Availability heuristic: Salient wins (Ranyard, 2018; Tversky & Kahneman, 1973; see also Decision Sampling Theory, Stewart, Chater, & Brown, 2006)
- Social activity?
- Excitement?
- 'entrapped'
  - Might miss the jackpot(Beckert & Lutter, 2013; Binde, 2013 uploaded; Forrest, Simmons, & Chesters, 2002)

Scratch Cards

Scratch Cards

- Low chance of winning high amounts
  - e.g., 1 in $4,347,890$ chance of winning $£4\ million$
- Reasonable chance of winning smaller amounts
  - e.g., 1 in 6 chance of winning $£10$
- Expected loss of $£3$ for every $£10$ spent

Scratch Cards

Explanations???

- Instant feedback
- Near miss effects
- Social
  - Gifts

Roulette

Roulette

- Transparent odds; Pure luck
- 37 slots (Europe - 38 in USA)
- Numbers from $0 - 36$
  - $\frac{1}{2}$ **Red**
  - $\frac{1}{2}$ **Black**
- Can bet on a single slot or a selection
  - Payout for single number is 35 to 1
  - Payout for even/odd, **Red**/**Black** is almost 1 to 1
  - Payout for selection of 12 numbers is 2 to 1 (Ranyard, 2018)

Roulette

- Expected return is $36/37$ ($36/38$ in USA)

Roulette

Explanations???

Roulette

- Can lead to ***Loss Chasing***
  - Gamblers continue to gamble more after a loss
- A **Mental Account** for a gambling session
  - If they stop they 'close' the account at a **loss**
    - A 'sure' loss
  - Keeping the mental account open the loss is not *realised* (still a *paper* loss)
    - possibility of winning it back(Ranyard, 2018)

Fruit Machines

Fruit Machines

- Fruit machines are said to be most addictive form of gambling
  - It takes just over a year to become addicted
    - Takes over three years with traditional table games, such as roulette(N. Turner & Horbay, 2004)
- 3 to 5 to five reels with pictures

Fruit Machines

- The player inserts a coin and then pulls down a handle (or presses a button)
  - The reels spin
  - When they stop, the combination of pictures forms a certain pattern
  - If the combination comprises three pictures that are the same (or some other designated pattern), a reward is given.
  - The most common winning combination is 777
- The odds of fruit machines are unknown
  - Pure chance

Fruit Machines and Near Misses

- ***Near Misses***: a losing pattern that is very similar to a winning one
  - e.g., reels may stop at 776 very similar to 777
- Gamblers feel that luck is with them and that success is on its way
  - Near-miss experiences tend to encourage more gambling (Griffiths, 1991; Reid, 1986)

Explaining Near Misses

- Evolutionary explanations?
  - In natural environments to which we are adapted by evolution, a near miss may be close to a win
    - e.g., almost catching prey clearly indicates that prey is nearby and your skill levels are probably adequate to make a kill
  - May not hold for artificial environments (776 is not $nearly$ 777)
- Near miss is mistaken for a gain
  - Same part of the brain(Clark, Lawrence, Astley-Jones, & Gray, 2009)
- Near misses registered as gains will result in gamblers' receiving positive reinforcement even when they are losing money

Card Games

Card Games

- Both luck and expertise
- Blackjack
  - Closest to 21 without exceeding 21
  - Not ***Pure Chance***
    - Counting cards (e.g., MIT blackjack team Mezrich, 2002)
  - Statistically possible to profit from Blackjack (unlike previous games) (DeDonno & Detterman, 2008; Javarone, 2015; N. E. Turner, 2008)

Card Games

- Poker
  - Different variations
  - Aim to have highest ranked combination of cards
- Players can choose to increase the stake or to fold
- Players win either by having the highest rank of the combination
  - or by being the only person remaining
- Evidence for expertise (DeDonno & Detterman, 2008; Fiedler & Rock, 2009; Hannum & Cabot, 2012; Javarone, 2015; N. E. Turner, 2008)

Sports betting

Sports betting

- Horse racing (16%)
- Football matches (4%)
- Dog racing (4%)
- Other (9%) (Ranyard, 2018; Wardle, Moody, Griffiths, Orford, & Volberg, 2011)
- Gamblers can bet against the bookmaker or against each other
- Traditionally, the bookmaker sets the odds
- The gamblers bet that a certain event will occur (back) and the bookmaker bets that it will not (lay)

Sports betting

- Gamblers may use statistics to inform their betting
- Not much evidence for expertise
  - Experts won more times than randomly selected betters
    - but did not win any more money (Ladouceur, Sylvain, Letarte, Giroux, & Jacques, 1998)
  - Experts were just more cautious - safe bets
    - not gambling at all is likely a safer strategy (Ranyard, 2018)
- Superstition
  - hot hand

Explanations for Gambling Behaviour

(taken from Ranyard, 2018, p. 305)

Explanations for Gambling Behaviour

Games	*Characteristics*	*Prevalence as a percentage all UK adults (Wardle et al., 2011)*	*Biases, fallacies, and other reasons to gamble*
Lottery	Low frequency, fixed odds, pure chance	National Lottery 59 Other lotteries 25	Overestimation of low odds The availability heuristic Entrapment The representativeness heuristic Illusions of control The gambler's fallacy The hot hand effect Superstitious behaviour The near-miss effect Mental accounting Loss chasing High testosterone levels Abnormal levels of neurotransmitters
Scratch cards	High frequency, fixed odds, pure chance	24	
Roulette	High frequency, fixed odds, pure chance	In a casino 5 Online games that include roulette 13	
Fruit machines	High frequency, fixed odds, pure chance	18	
Sports betting	High frequency, flexible odds, may involve real skills	Horse racing 16 Football 4 Dog racing 4 Other sports events 9	
Card games	High frequency, flexible odds, may involve real skills	Poker (pub or club) 2 Casino card games 5 Online games that	

Alternative Explanations?

Alternative Explanations - Motivation

- learning and evaluating, rush, self-definition, risk-taking, cognitive self-classification, emotional self-classification, competing and communing (Cotte, 1997)
- control, lift, escape (Loroz, 2004)
- financial gain, intellectual challenge, excitement and social interaction (Bruce & Johnson, 1992)
- socialization, amusement, avoidance, excitement and monetary motives (Lee, Chae, Lee, & Kim, 2007)

Alternative Explanations - Motivation (contd.)

- money, excitement, social interaction, escape from problems, and self-esteem enhancement (Fang & Mowen, 2009)
- to win money, fun, for social reasons, excitement, just to have something to do (Neighbors, Lostutter, Cronce, & Larimer, 2002)
- winning, exploration, excitement, being friends, and being with similar people (Platz & Millar, 2001)

Five Dimensions (Binde, 2013)

1. The dream of hitting the jackpot
2. Social rewards
3. Intellectual challenge
4. Mood change
5. **The chance of winning**

- $1-4$ can be dependent on personal dispositions and preferences
- 5 is always relevant

Tony 10

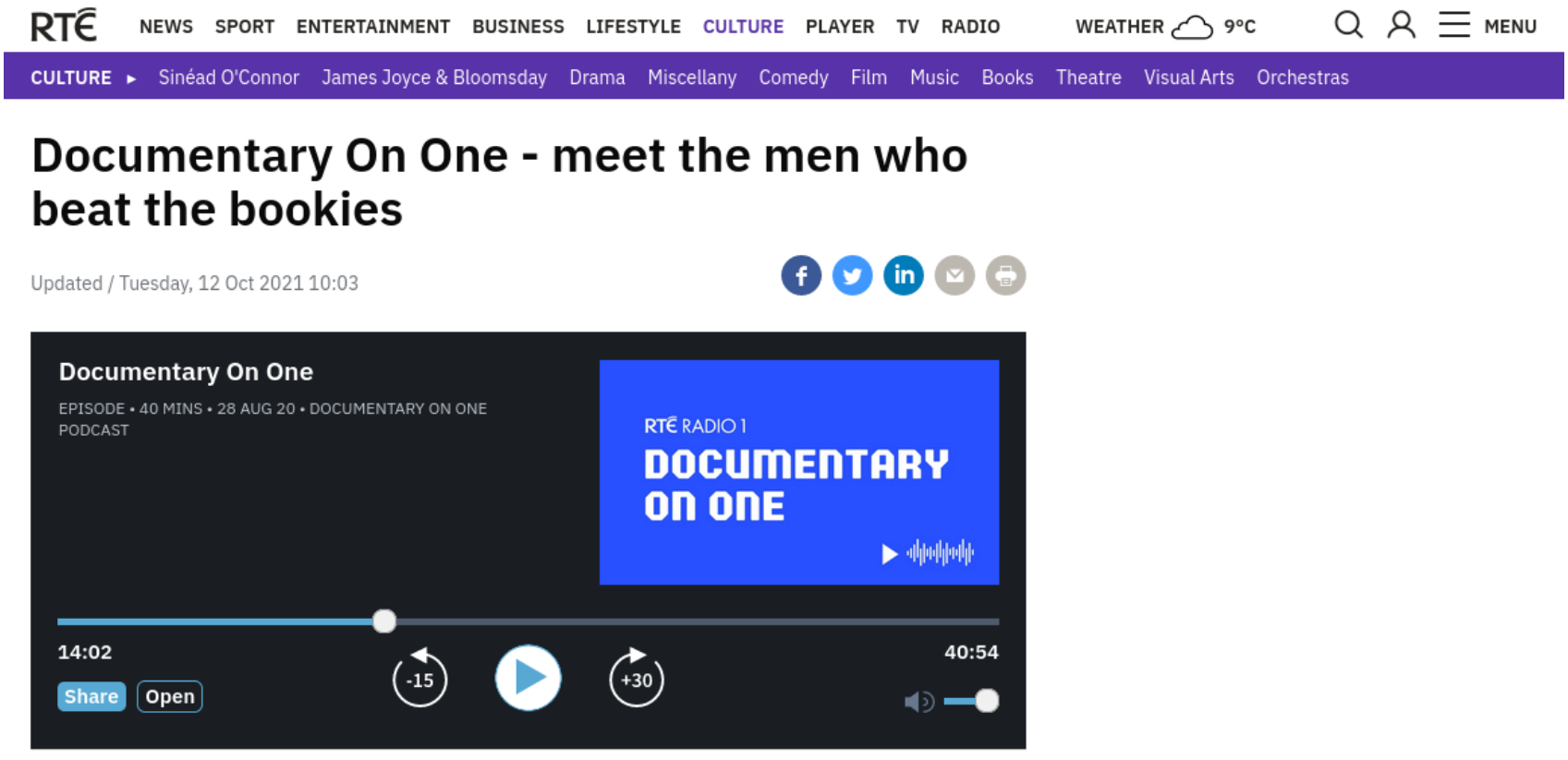
Tony 10

- Gambled $€10m$ with Paddy Power
- Stole $€1.75m$ from An Post
- His online-gambling addiction cost him his marriage
- Sentenced to 4 years in jail (served 18 months)
- Book (Lynch & O'Reilly, 2018)

Sports betting

https://www.youtube.com/embed/1pWSppSdWWc?start=130

Sports betting



Beating the bookies

- beating the bookies
  - listen at https://www.rte.ie/radio/radio1/clips/11230292/

Problem Gambling

Problem Gambling

RTÉ NEWS SPORT ENTERTAINMENT BUSINESS LIFESTYLE CULTURE PLAYER TV RADIO WEATHER 9°C MENU

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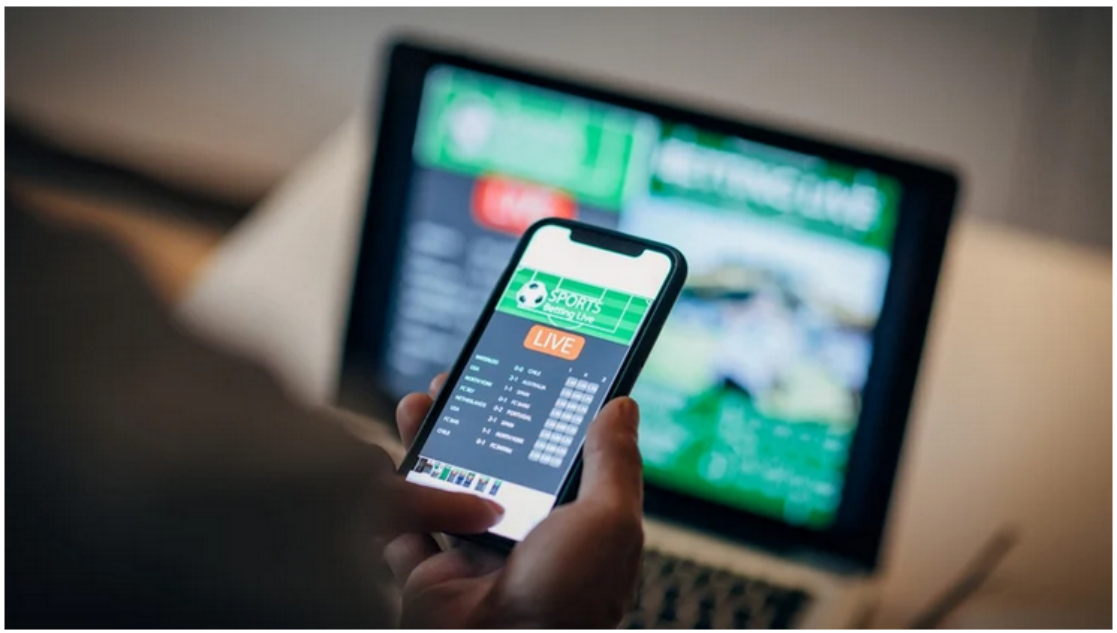
Problem gambling more widespread than previously thought - ESRI

Updated / Thursday, 5 Oct 2023 19:07



The ESRI says the new figure would equate to 130,000 adults with problem gambling in Ireland (stock image)

Problem Gambling

- RTE Coverage at https://www.rte.ie/news/2023/1005/1409029-problem-gambling-ireland/ including clip from Morning Ireland
- ESRI Press Release at https://www.esri.ie/news/esri-estimates-1-in-30-adults-in-ireland-now-suffers-from-problem-gambling
- Full ESRI report at https://www.esri.ie/system/files/publications/RS169.pdf

Problem Gambling

- Problem gambling / gambling addiction / pathological gambling
  - defined 'persistent and recurrent problematic gambling behavior leading to clinically significant impairment or distress'(Association, 2013; Ranyard, 2018)
- Positively correlated to being male, young, having a low level of education, and having a low socio-economic status (Ranyard, 2018; Wardle et al., 2011)
- Problem gamblers viewing gambling scenarios
  - show decreased brain activity in regions that control impulse, emotion, and decision-making and that respond to loss
  - increased activity in regions associated with pleasure and risk taking(Potenza, 2014; Potenza et al., 2003; van Holst, van den Brink, Veltman, & Goudriaan, 2010)

Problem Gambling

- Linked with high testosterone levels
  - Iowa Gambling Task (Stanton, Liening, & Schultheiss, 2011)
- Multiple findings suggest a biological basis for risk seeking (Ranyard, 2018)

Problem Gambling

- 3 kinds of problem gambler
  - Poor judgement and decision making skills
    - No prior psychopathology
    - Habit develops: illusion of control/excitement/chasing losses etc.
  - Satisfy emotional needs
    - Family history / emotional vulnerabilities
  - Neurological / neurochemical dysfunctions
    - Impulsive/anti-social behaviours; substance abuse; criminality(Blaszczynski & Nower, 2002; Ranyard, 2018)

Further Reading

- Binde, P. (2013). Why people gamble: a model with five motivational dimensions. *International Gambling Studies*, *13*(1), 81–97. https://doi.org/10.1080/14459795.2012.712150

Further ‘reading’

https://www.youtube.com/embed/7cjIWMUgPtY

References

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Beckert, J., & Lutter, M. (2013). Why the Poor Play the Lottery: Sociological Approaches to Explaining